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study of the larvae of these forms, discovered the interesting fact that the males have the eyes modified to secure a kind of double vision.

The lower portion of each compound eye is segmented off into a distinct lobe, having a somewhat different radius of curvature. (Plate II, Fig. 1).

This lower lobe is heavily pigmented, and since its ommatidia are directed downward, is adjusted for seeing in the lesser light; while the upper, larger lobes are less pigmented, or non-pigmented, and face upward toward the primary source of light.

A subsequent examination of many different aquatic larvae showed that the eyes of most of them present a distinct pigmental division into an upper and lower portion.

This modification is probably of larval adjustment, an adaptation to the condition of a stronger surface light and a more subdued reflection from the bottom of the pool or stream.

E. W. ROBERTS.

EXHAUSTION AND SENILITY IN NERVE CELLS

Dolley (Jour. Med. Research, April, 1911) gives an interesting account of recovery from exhaustion known to occur in nerve cells as the result of activity. In exhaustion the following conditions of cells may be distinguished.

1. Cells (which in young, healthy animals are the great majority) that come fully back after activity to a resting condition. The general cell-contents is restored first, the nucleus (exhausted first) is last to be restored.

2. Cells that suffer, thru activity, some qualitative damage and disorganization of structure,—either (a) temporary, i. e. capable of a large degree of restoration, or (b) in which the disintegration is so profound that it represents a permanent loss.

In the cases of temporary disorganization an irregularity in the form of the cells is shown, due to loss of substance. With repetition of activity (and with increased age) this irregularity becomes permanent and exaggerated, accompanied by deficiency in chromatin, by loss of nucleus, etc. A perfect natural series from

PLATE II

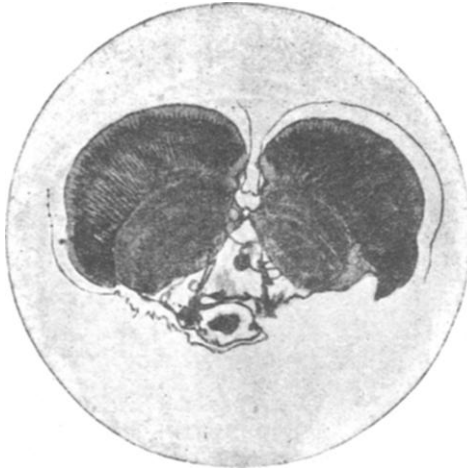


Fig. 1. Section of Compound Eyes of Larva of May-fly (See p. 320).

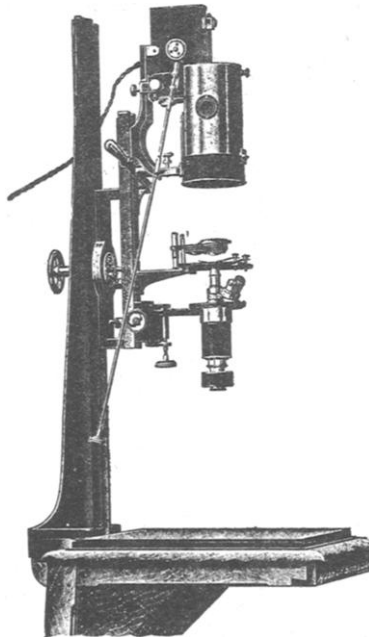


Fig. 2. *Edinger's Drawing and Projection Apparatus* [Ernest Leitz]

This cut illustrates the piece of apparatus described on page 239 of the July number of this Journal.

temporary and slight to extreme and permanent disorganization may be found. His conclusions are:—

1. Power of recuperation is inherent in all nerve cells as long as they are really alive, but differs in different individuals and at different ages, with different degrees of fatigue, and with different degrees of "training." The chromatin of the cell furnishes a valuable index to the physiological recuperation.

2. Old age and death, from the point of view of the nerve cell, are the natural results of past activities and incomplete recoveries.

3. Premature senility is the certain outcome of injudicious and extravagant and long continued expenditure of energy without adequate chance of suitable rest and recuperation. Resting senile types resemble exhausted youthful types. On the other hand suitable use and proper restoration regularly repeated give power of resistance to the nerve cells.

TREPONEMA PALLIDA IN PURE CULTURES

Noguchi (Jour. Exp. Med., Aug., 1911) reports the reproduction of syphilitic lesions in rabbits by means of pure cultures of *Treponema pallidum* (*Spirochaeta pallida*). He passed the gross human infection thru numbers of generations of rabbits. He used infected rabbit tissues instead of human for getting pure cultures. This gave him control of material. In purifying the strain, he used cultures made of serum water (sheep, horse, rabbit) to which a piece of sterile rabbit tissue (testicle or kidney) had been added.

He had great difficulty in getting pure strains. To get the first generation of *Treponema pallidum* in virulent form, the following conditions are essential:—

1. Presence of suitable fresh sterile tissue in serum water.
2. Strict anaerobiosis.
3. Slightly alkaline reaction.
4. Temperature 35°-37°C.

He used combination hydrogen gas, vacuum, and pyrogallic acid in an aerobic apparatus to secure strict anaerobic conditions. He was thus able to establish that testicular lesions produced in